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EXAMINER

SMITH, NICHOLAS A

ART UNIT PAPER NUMBER

1742

DATE MAILED: 12/04/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

10/762,691

Applicant(s)

KOMAI ET AL.

Examiner

Nicholas A. Smith

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 27 September 2006.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-6 is/are pending in the application.
- 4a) Of the above claim(s) 4-6 is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-3 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO/SB/08)
Paper No(s)/Mail Date _____.
- 4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____.
- 5) ☐ Notice of Informal Patent Application
- 6) ☐ Other: _____.

DETAILED ACTION

Election/Restrictions

1. Applicant's election without traverse of claims 1-3 in the reply filed on 27 September 2006 is acknowledged.
2. Claims 4-6 are withdrawn from further consideration pursuant to 37 CFR 1.142(b) as being drawn to a nonelected invention, there being no allowable generic or linking claim. Election was made **without** traverse in the reply filed on 27 September 2006.

Status of Claims

3. Claims 1-3 remain for examination. Claims 4-6 are withdrawn from consideration.

Means-Plus-Function Language

4. The following terms have been expressed in "means-plus-function" language in the instant claims and have been interpreted as follows:
 - a. "means for supplying said electropolishing liquid, said free abrasive grains, and pure water in the quantities controlled by said chemical liquid control unit" (claim 1, lines 5-8) is recited in proper means-plus-function format, and had been interpreted to mean the structure recited:
 - i. in the specification at page 12, line 22 to page 13, line 1; or
 - ii. in the specification at page 21, line 8 to line 15.

Claim Rejections - 35 USC § 102

5. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

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A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

6. Claim 1 is rejected under 35 U.S.C. 102(b) as being anticipated by Uzoh et al. (US Patent 5,807,165).

7. Uzoh et al. discloses (Figures 5-9, col. 4, line 34 to col. 5, line 65) an apparatus comprising: a polishing surface plate (**62 & 63**) including a cathode (**63**) and turnably disposed (Figure 7); a porous polishing pad (**64**) disposed on a polishing surface plate capable of conductivity; a substrate holding unit (**66**) with a work surface (**18**) of a work substrate (**W**) and turnably disposed (Figure 7) and opposed to a polishing surface of a polishing pad (**64**); an anode (**67**) in contact with a work surface (**18**); a chemical supply unit (**70, 72**) capable of delivering a chemical liquid onto a polishing pad (**64**); and a power source to deliver power between anode and cathode (**80**).

Claim Rejections - 35 USC § 103

8. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

9. Claim 2 is rejected under 35 U.S.C. 103(a) as being unpatentable over Uzoh et al. in regards to claim 1 as stated above, in view of Duboust et al. (US 2003/0116446), further in view of Chang et al. (US 6,206,760), and further in view of Kondo et al. (US 2002/0061722).

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10. In regards to claim 2, claim limitation “for individually controlling the quantities of said electropolishing liquid, free abrasive grains, and pure water supplied” is intended use and therefore is not granted any patentable weight. See MPEP 2114.

11. Uzoh et al. discloses a chemical supply unit (70, 72, Figure 7).

12. Uzoh et al. does not specifically disclose means for supplying said electropolishing liquid in a controlled flow rate by said chemical liquid control unit as interpreted by means-plus-function language supported in the specification at page 21, line 8 to line 15.

13. Duboust et al. pertains to electrochemical mechanical polishing (ECMP) (paragraph [0011]) and is in the same field of endeavor as Uzoh et al. Duboust et al. teaches a method and means for controlling electrolyte composition (paragraphs [0028]-[0036]). It would have been obvious to one of ordinary skill in the art to modify Uzoh et al.'s ECMP apparatus with Duboust et al.'s means for controlling electrolyte composition in order to regulate a continuous system and to avoid interference with other system additives (Duboust et al., paragraph [0008]).

14. Uzoh et al. in view of Duboust et al. teach a means for supplying electropolishing liquid in a controlled flow rate by said chemical control liquid unit.

15. However, Uzoh et al. in view of Duboust et al. do not specifically teach a means for delivering individually controlled flow rates of pure water as interpreted by means-plus-function language supported in the specification at page 21, line 8 to line 15.

16. Chang et al. pertains to chemical mechanical polishing (CMP), which is in the same field of endeavor with those concerned with planarizing semiconductor surfaces

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(Chang et al., abstract; Duboust et al., abstract; Uzoh et al., abstract). Chang et al. teaches means for individually controlled cleaning solution of DI water (col. 6, lines 13-57). It would have been obvious to one of ordinary skill in the art to modify Uzoh et al. in view of Duboust et al.'s planarizing apparatus with Chang et al.'s means for individually controlling cleaning solution in order to remove foreign substances from the CMP apparatus and reduce contamination (Chang et al., col. 6, lines 48-57).

17. Uzoh et al. in view of Duboust et al. and further in view of Chang et al. teach a means for supplying individually controlled electropolishing liquid and pure water.

18. However, Uzoh et al. in view of Duboust et al. and further in view of Chang et al. do not specifically teach a means for delivering individually controlled flow rates of free abrasive grains as interpreted by means-plus-function language supported in the specification at page 21, line 8 to line 15.

19. Kondo et al. pertains to chemical mechanical polishing (CMP), which is in the same field of endeavor with those concerned with planarizing semiconductor surfaces (Chang et al., abstract; Duboust et al., abstract; Uzoh et al., abstract; Kondo et al., paragraph [0002]). Kondo et al. teaches means for individually controlled free abrasive grains (paragraphs [0053]-[0056], Figure 1). It would have been obvious to one of ordinary skill in the art to modify Uzoh et al.'s in view of Duboust et al. and further in view of Hong et al.'s planarizing apparatus with Kondo et al.'s means for individually controlled free abrasive grains in order to produce an accurate polishing rate (Kondo et al., paragraph [0002]).

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20. Claim 3 is rejected under 35 U.S.C. 103(a) as being unpatentable over Uzoh et al. in regards to claim 1 as stated above, in view of Duboust et al.

21. Uzoh et al. does not specifically disclose a cup for receiving a chemical liquid discharged from the top of said polishing pad, said cup provided around side periphery of said polishing surface plate and on the bottom side of the said polishing surface plate or a chemical liquid discharge unit provided in said cup at a position lower than said polishing surface plate.

22. Duboust et al. teaches a cup (**202**, Figure 1) for receiving a chemical liquid discharged from the top of said polishing pad, said cup (**202**, Figure 1) provided around side periphery of said polishing surface plate and on the bottom side of the said polishing surface plate or a chemical liquid discharge unit (**214**, Figure 1) provided in said cup at a position lower than said polishing surface plate. It would have been obvious to one of ordinary skill in the art to modify Uzoh et al.'s ECMP apparatus with Duboust et al.'s cup and chemical liquid discharge unit in order recycle and recondition the used polishing solution (Duboust et al., paragraph [0028]).

Conclusion

23. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. Hong (US 2004/0087257) is pertinent to CMP apparatus with means for cleaning solution dispensation.

24. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Nicholas A. Smith whose telephone number is (571)-

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272-8760. The examiner can normally be reached on 8:30 AM to 5:00 PM, Monday through Friday.

25. If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Roy King can be reached on (571)-272-1244. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

26. Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

NAS


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